

(5) The source water for all test cycles must be characterized by measurement of water quality parameters as follows:

(i) For all BWMS tests, salinity, temperature, and turbidity must be measured either continuously during or at the beginning, middle, and end of the period of ballast water uptake, as appropriate and practicable for the parameters to be measured.

(ii) Water quality parameters (e.g., dissolved and particulate organic material, pH, etc.) that may affect the efficacy of BWMS that make use of active substances or other processes, or water quality parameters identified by the manufacturer and/or the independent laboratory as being critical, must be measured either continuously during or at the beginning, middle, and end of the period of ballast water uptake, as appropriate and practicable for the parameters to be measured.

(h) Samples of ballast water must be collected from in-line sampling ports in accordance with the sampling specifications in the ETV Protocol.

(i) The following information must be documented during the entire period of BWMS testing operations conducted on the vessel:

(1) All ballast water operations, including volumes and locations of uptake and discharge.

(2) All test cycles, even those in which the BWMS failed to meet the BWDS, must be documented. The possible reasons for an unsuccessful test cycle must be investigated and included in the Test Report.

(3) All weather conditions and resultant effects on vessel orientation and vibration.

(4) Scheduled maintenance performed on the BWMS.

(5) Unscheduled maintenance and repair performed on the BWMS.

(6) Data for all engineering parameters monitored as appropriate to the specific BWMS.

(7) Consumption of all solutions, preparations, or other consumables necessary for the effective operation of the BWMS.

(8) All parameters necessary for tracking the functioning of the control and monitoring equipment.

(9) All instrument calibration methods and frequency of calibration.

(j) All measurements for numbers and viability of organisms, water quality parameters, engineering performance parameters, and environmental conditions must be conducted in accordance with the ETV Protocol. Where alternative methods are necessary, given constraints of the BWMS and/or the vessel, standard methods from recognized bodies such as EPA (in 40 CFR part 136), the International Standards Organization, or others accepted by the scientific community must be used, and must be accepted in advance by the Coast Guard.

(k) Test vessels discharging treated ballast water into the waters of the United States must be enrolled in the U.S. Coast Guard's Shipboard Technology Evaluation Program. Test vessels discharging treated ballast water into waters of other countries must secure all necessary approvals and permits required for discharges of treated ballast water.

**§ 162.060-30 Testing requirements for ballast water management system (BWMS) components.**

(a) The electrical and electronic components, including each alarm and control and monitoring device of the BWMS, must be subjected to the following environmental tests when in the standard production configuration:

(1) A resonance search vertically up and down, horizontally from side to side, and horizontally from end to end, at a rate sufficiently low as to permit resonance detection made over the following ranges of oscillation frequency and amplitude:

(i) At 2 to 13.3 Hz with a vibration amplitude of  $\pm 1$  mm.

(ii) At 13.2 to 80 Hz with an acceleration amplitude of  $\pm 0.7$  g.

(2) The components must be vibrated in the planes specified in paragraph (a)(1) of this section at each major resonant frequency for a period of 4 hours.

(3) In the absence of any resonant frequency, the components must be vibrated in each of the planes specified in paragraph (a)(1) of this section at 30 Hz with an acceleration of  $\pm 0.7$  g for a period of 4 hours.

(4) Components that may be installed in exposed areas on the open deck or in enclosed spaces not environmentally controlled must be subjected to a low temperature test of  $-25^{\circ}\text{C}$  and a high temperature test of  $55^{\circ}\text{C}$  for a period of 2 hours at each temperature. At the end of each test, the components are to be switched on and must function normally under the test conditions.

(5) Components that may be installed in enclosed spaces that are environmentally controlled, including an engine room, must be subjected to a low temperature test at  $0^{\circ}\text{C}$  and a high temperature test at  $55^{\circ}\text{C}$ , for a period of 2 hours at each temperature. At the end of each test, the components are to be switched on and must function normally under the test conditions.

(6) Components must be switched off for a period of 2 hours at a temperature of  $55^{\circ}\text{C}$  in an atmosphere with a relative humidity of 90 percent. At the end of this period, the components must be switched on and must operate satisfactorily for 1 hour under the test conditions.

(7) Components that may be installed in exposed areas on the open deck must be subjected to tests for protection against heavy seas in accordance with IP 56 of publication IEC 60529 (incorporated by reference, *see* § 162.060-5) or its equivalent.

(8) Components must operate satisfactorily with a voltage variation of  $\pm 10$  percent together with a simultaneous frequency variation of  $\pm 5$  percent, and a transient voltage of  $\pm 20$  percent together with a simultaneous transient frequency of  $\pm 10$  percent and transient recovery time of 3 seconds.

(9) The components of a BWMS must be designed to operate when the vessel is upright and inclined at any angle of list up to and including  $15^{\circ}$  either way under static conditions and  $22.5^{\circ}$  under dynamic, rolling conditions either way and simultaneously inclined dynamically (pitching)  $7.5^{\circ}$  by bow or stern. Deviation from these angles may be permitted only upon approval of a written waiver submitted to the Coast Guard in accordance with § 162.060-10(b)(1) of this subpart, taking into consideration the type, size, and service conditions and locations of the vessels and operational functioning of the

equipment for where the system will be used. Any deviation permitted must be documented in the type-approval certificate.

(10) The same component(s) must be used for each test required by this section and testing must be conducted in the order in which the tests are described, unless otherwise authorized by the Coast Guard.

(b) There must be no cracking, softening, deterioration, displacement, breakage, leakage, or damage of components or materials that affect the operation or safety of the BWMS after each test. The components must remain operable after all tests.

**§ 162.060-32 Testing and evaluation requirements for active substances, preparations, and relevant chemicals.**

(a) A ballast water management system (BWMS) may not use an active substance or preparation that is a pesticide unless the sale and distribution of such pesticide is authorized under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) for use in ballast water treatment prior to submission to the Coast Guard for approval of the BWMS. This requirement does not apply to the use of active substances or preparations generated solely by the use of a device (as defined under FIFRA) onboard the same vessel as the ballast water to be treated.

(b) The manufacturer of a BWMS that uses an active substance or preparation that is not a pesticide, or that uses a pesticide that is generated solely by the use of a device (as defined under FIFRA) onboard the same vessel as the ballast water to be treated, must prepare an assessment demonstrating the effectiveness of the BWMS for its intended use, appropriate dosages over all applicable temperatures, hazards of the BWMS, and means for protection of the environment, and public health. This assessment must accompany the application package submitted to the Coast Guard.

**§ 162.060-34 Test Report requirements.**

The Test Report prepared and submitted by an independent laboratory must be formatted as set out below.